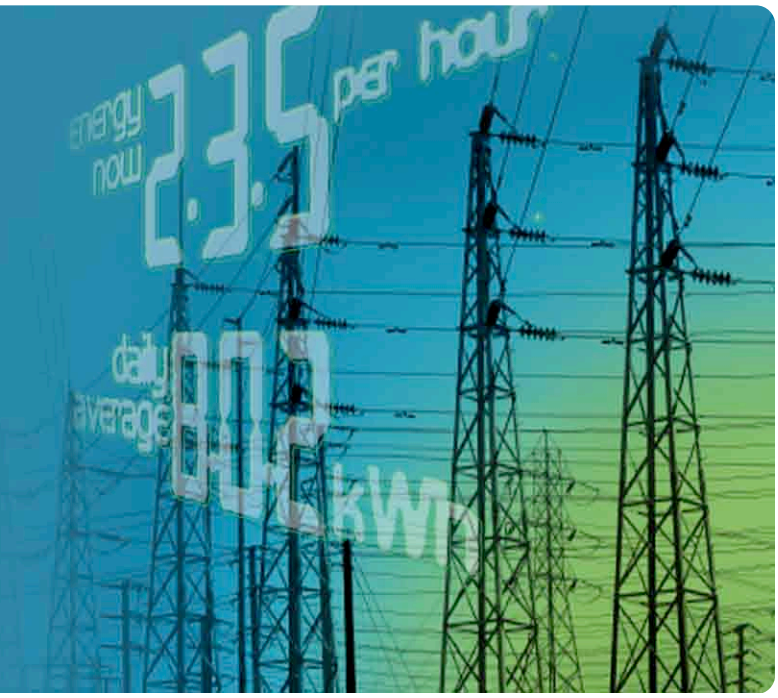
Open Automated Demand Response Implementations: Strong Support from Vendors & International Deployments

Many energy management and controls systems manufacturers and vendors embraced the OpenADR specification because of its simplicity, short development time, and its ability to ready their products for smart grid transactions with grid-to-building communications using OpenADR.



In recent years, increased attention to, and funding for, smart grid interoperability standards and deployments has raised the profile of Open Automated Demand Response (OpenADR). At the time of the initial smart grid discussions in 2009, OpenADR was the only specification for demand response (DR) that was field tested and implemented by many energy management and controls systems (EMCS) manufacturers and vendors. After all, it has been used by the utilities in California to automate a portion of their DR programs since January 2007.

In May 2009, OpenADR became one of the first 16 smart grid standards supported by the U.S. Department of Energy. Since its version 1.0 release, OpenADR information exchange model has been donated to the Organization for Advancement of Structured Information Standards to be developed into a full standard by the Energy Interoperation technical committee. During this period of being released as a specification and its development as one of the smart grid standards, more than 60 building controls vendors for residential, commercial, and industrial facilities have developed products with it and deployed their technologies throughout the country through a variety of DR pilots, prgrams and utility-and government-funded activities.

The EMCS manufacturers and vendors embraced the OpenADR specification because of its simplicity, the short time it takes to develop products with it, and its ability to ready their products for smart grid transactions with grid-to-building communications using OpenADR. Table 1 below shows a small sample of vendors that have publicized their development efforts.

Type	Vendor
Commercial Controls	Honeywell, Novar, Tridium, Siemens, Schneider, Johnson Controls, LimeAmps, Lutron, Wattstopper
Industrial Controls	Invensys, PowerIT, Cassatt, IC Systems, Iris Connections, M2M Communications
Residential Controls	Tendril, Our Home Spaces, EZ Integration, Universal Devices, JetLun Corporation
Other	Stonewater Controls, RTP Controls, Sure Grid, Regen, EnergyICT

Table 1. A Sample of vendors that have developed products with OpenADR

Continued on next page

DEMAND RESPONSE RESEARCH CENTER

In October 2010, OpenADR was identified as one of the two highest-scoring protocols deemed capable of meeting the Association of Home Appliance Manufacturers' (AHAM) criteria for installation, ease of use, interoperability, reliability, privacy, security, and safety.[1] Today, 3M Filtrete brand (available at Home Depot) incorporates a USnap port that can accommodate an OpenADR communications module.

The EMCS vendors have expanded their implementations to offer the infrastructure nationally and internationally. These OpenADR pilots and deployments are summarized in Figure 1.

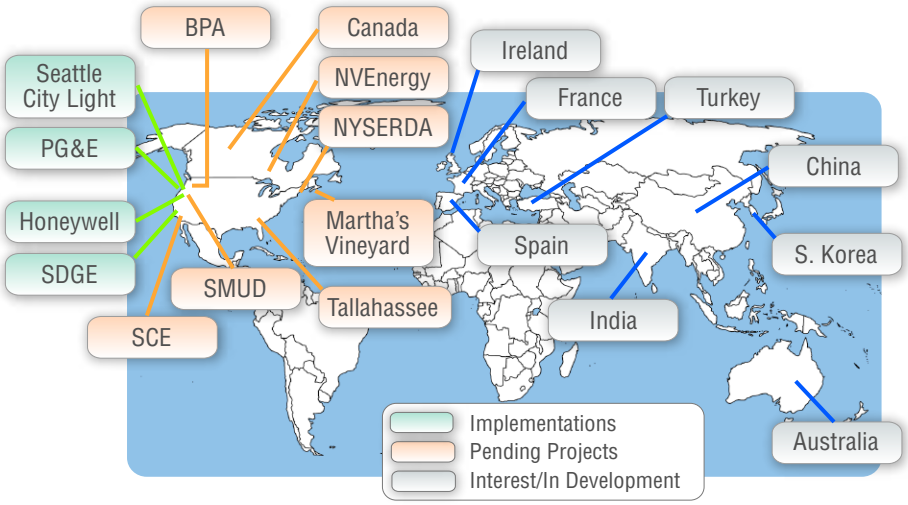


Figure 1. National and international OpenADR pilots and deployments

Implementations

- Pacific Gas & Electric Company: AutoDR deployments have been underway since 2005. Currently 200 large commercial and industrial (C&I) accounts are yielding a 45 MW peak reduction. A small C&I pilot has just been completed, and DRRC is providing active technical assistance.
- Southern California Edison: AutoDR deployments have been underway since 2007; approximately 60 large C&I accounts are yielding 25 MW.
- San Diego Gas & Electric Company: AutoDR deployments have been underway since 2006; aggregator-supported small and medium C&I accounts.
- Sacramento Municipal Utility District: A small commercial pilot in 2008. Planning a 4 MW OpenADR deployment in 2011.
- Seattle City Light: The DRRC conducted pilots in downtown Seattle to assess summer and winter DR opportunities. The four-site pilot program yielded a 14% peak load reduction.
- Bonneville Power Administration: Currently conducting several C&I OpenADR pilots.
- NV Energy: OpenADR is included in the utility infrastructure for ALL customers.

Pending Projects

- Honeywell received an ARRA (Recovery Act) grant to implement 700 sites and 80 MW reduction in California.
- GE Martha's Vineyard pilot received ARRA funding for an OpenADR smart appliance demonstration project.
- City of Tallahassee has a small, OpenADR-based, ARRA-funded smart grid demonstration project.
- DRRC has a research grant award pending from NYSERDA to demonstrate retail price response.
- National Resources Canada and CANMET are developing an OpenADR-based pilot in downtown Toronto.
- China Power and Light is funding an OpenADR pilot study in their territory.
- Several OpenADR pilots are underway in Australia.

In addition, there have been requests for information and meetings to discuss technical details and evaluate possible applications from Ireland, France, Spain, Japan, India, South Korea, and Turkey.

[1] AHAM. 2010. *Assessment of Communications Standards for Smart Appliances: The Home Appliance Industry's Technical Evaluation of Communication Protocols.* http://www.aham.org/ht/a/GetDocumentAction/i/50696

Related Links:

Demand Response Research Center and Publications: http://drrc.lbl.gov/drrc-pubs.html
OpenADR Website: http://openadr.lbl.gov
OpenADR Alliance: http://www.openadr.org/

Key OpenADR Articles and Materials:

Findings from *Seven Years of Field Performance Data for Automated Demand Response in Commercial Buildings,* Kiliccote, S., M.A. Piette, J. Mathieu, K. Parrish. In the *Proceedings of the 2010 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, CA*, August 15-20, 2010. LBNL-3643E. May 2010.
http://drrc.lbl.gov/pubs/lbnl-3643e.pdf

CEC OpenADR-Version 1.0 Report. Piette, M.A., G. Ghatikar, S. Kiliccote, E. Koch, D. Hennage, P. Palensky, and C. McParland. 2009. *Open Automated Demand Response Communications Specification (Version 1.0).* California Energy Commission, PIER Program. CEC-500-2009-063 and LBNL-1779E.

BERKELEY LAB

Contact:
Email: drrc@lbl.gov
Tel: 510-486-6845

PIER PUBLIC INTEREST ENERGY RESEARCH "Research Powers the Future"